Long-Term Efficacy of intrathecal therapy in chemotherapy-induced peripheral neuropathy

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BACKGROUND

Chemotherapy-induced peripheral neuropathy (CIPN) is found in 68% of patients in the first month after chemotherapy, and then 60 and 30% after 3 and > 6 months, respectively[1]. Pharmacological therapy with multimodal therapy that includes duloxetine[2] and ligands of the alpha-2-delta subunits of the voltage-gated Ca-channel have been shown to be successful in many patients[3]. However, a small percentage of patients do not achieve adequate pain control when using these combinations due to lack of treatment response or side effects that limit quality of life. We have used intrathecal therapy (ITT) to treat these patients. The purpose of this study is to evaluate the long-term effectiveness of ITT in patients with chemotherapy-induced peripheral neuropathy that failed optimized multimodal pharmacological therapy.

METHODS

IRB approval was obtained. The data of 5 patients who had ITT for CIPN of the lower extremities (LEs) from 2015 to date was collected. All the patients were treated with combinations of low-dose hydromorphone (<0.5 mg/day), low-dose bupivacaine (<10 mg/day) and high-dose clonidine (>1000 mcg/day) after a successful epidural trial conducted over a 2 week period. The IT catheter was placed using a retrograde approach, with the tip positioned at the L5-S1 intervertebral area. To determine effectiveness, we used the Comprehensive Pain Assessment Questionnaire (CPAQ) variables at pre-pump implantation, one week, one month, 3 months, and every 6 months, after implantation. Success was defined as a 30% decrease in pain, a global impression of improvement score (GIOI) ≥2, and a 30% decrease in pain interference with family and home activities. Additionally, we used the Beck Inventory to assess patients' tendency to catastrophize their pain with measures of helplessness, rumination, and magnification. Given the small number of individuals in the cohort (n = 5), it was not feasible to perform conventional regression modeling or other inferential statistical analyses for meaningful interpretation. However, the descriptive summaries provide useful insights into the treatment outcomes.

TABLE 1

TABLE 1: TIME TO REACH TREATMENT SUCCESS BY DIFFERENT CRITERIA (IN DAYS)

Patient	Pain Score Now	Least Pain in 24h	Least Livable Pain	GIOI	Functional Impairment
1	50	50	50	50	938
2	84	51	51	51	84
3	-	-	30	198	1121
4	28	63	28	2522	378
5	110	69	54	582	526
Mean	68	66	54	586	526
Median	67	57	50	110	378

GIOI = Global Impression of Improvement Score

RESULTS

Results are presented in Table 1. There was no evidence of catastrophizing personalities among the patients studied. All patients had a decrease in the total amount of oral opioids and anti-neuropathics, although a statistical analysis was not performed. Analysis of catastrophizing information did not yield any association between ITT success and the personality assessments.

DISCUSSION

The delay in obtaining adequate pain relief and improvement in function is disconcerting. This is despite patients undergoing an epidural trial with medication titration for 2 weeks in an outpatient setting. However, all patients did decrease their reliance on oral medications after 3 months of therapy. As noted, we did not perform statistical analyses to determine if the decrease in opioids and anti-neuropathics was significant because of the small sample size. This data suggests that IT pump implantation for the treatment of CIPN of the LEs is an effective form of therapy in the most difficult population where there was no success with multimodal anti-neuropathic therapy. However, both the patient and the treating physician will need to understand that there will be a delay of about 2 months in reaching a 30% pain reduction and about 4 months before the patient reports improvement in the success of therapy. We are currently including this information in the operative consent form.

REFERENCES

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